Donohue

PRELIMINARY Health Assessment for

HIMCO LANDFILL

ELKHART, INDIANA

CERCLIS NO. IND980500292

MARCH 1, 1989

Agency for Toxic Substances and Disease Registry
U.S. Public Health Service

THE ATSDR HEALTH ASSESSMENT: A NOTE OF EXPLANATION

Section 104(i)(7)(A) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended, states "...the term 'health assessment' shall include preliminary assessments of potential risks to human health posed by individual sites and facilities, based on such factors as the nature and extent of contamination, the existence of potential pathways of human exposure (including ground or surface water contamination, air emissions, and food chain contamination), the size and potential susceptibility of the community within the likely pathways of exposure, the comparison of expected human exposure levels to the short-term and long-term health effects associated with identified hazardous substances and any available recommended exposure or tolerance limits for such hazardous substances, and the comparison of existing morbidity and mortality data on diseases that may be associated with the observed levels of exposure. The Administrator of ATSDR shall use appropriate data, risk assessments, risk evaluations and studies available from the Administrator of EPA."

In accordance with the CERCLA section cited, ATSDR has conducted this preliminary health assessment on the data in the site summary form. Additional health assessments may be conducted for this site as more information becomes available to ATSDR.

PRELIMINARY HEALTH ASSESSMENT

Himco Landfill

Elkhart, Indiana

Prepared by:

Indiana State Health Department

Under Cooperative Agreement (No. U50-ATU502884-01)

with

The Agency for Toxic Substances and Disease Registry

March 1989

PRELIMINARY HEALTH ASSESSMENT
HIMCO LANDFILL
ELKHART COUNTY, INDIANA
MARCH 1, 1989

Prepared by:
Indiana State Board of Health
Indianapolis, Indiana

Prepared for:
Office of Health Assessment
Agency for Toxic Substances and Disease Registry

BACKGROUND:

Himco Landfill covers approximately 40 acres of former marsh land. The site is located at the intersection of County Road 10 and the Nappanee Extension in the Town of Elkhart, Elkhart County, Indiana. The site operated between 1960 and 1976 under the ownership of Mr. Charles Himes. A marshy area was excavated to a depth of 15 to 20 feet and general refuse, medical and surgical waste, pharmaceutical products including off-specification drugs, and industrial waste were landfilled in these holes. The groundwater is contaminated with cobalt, selenium, beryllium, cadmium, copper, manganese, and other metals. A plume of contamination was discovered during a United States Geological Survey (USGS) hydrogeological study of the Elkhart area. The plume has been determined to originate from the landfill.

Specific records of exact locations of buried waste on the Himco site are not available. As waste was brought in, the marshy land was filled in, then covered with sand. At the center of the site the elevation is built up approximately 15 feet. Along the perimeter it is five feet higher than the original ground level. This would indicate that waste may have been deposited over the entire 40 acres. Many areas of stressed vegetation exist on site. During a U.S. Environmental Protection Agency (EPA) inspection in 1984, EPA observed several accumulations of leachate, primarily calcium sulfate, at various locations throughout the site. "Methane" and "sulfate" odors were also detected throughout the site.

There are six residences located immediately next to the landfill. Contamination of the residences' shallow groundwater wells was discovered in 1972. In 1974, the State Health Commissioner advised the owner to drill deep wells to replace these six contaminated shallow residential wells. In 1975, the owner signed a Consent Agreement that resulted in the closing of the landfill in September of 1976.

A site inspection was performed by staff from the Indiana State Board of Health and Department of Environmental management on December 12, 1988. There are numerous locations on the site where previously disposed materials lay uncovered and exposed to the environment. Small game were observed on the site. Access to the site is not restricted.

GEOLOGY:

A three-year study in northwest Elkhart County was performed by USGS to (1) define the general flow and quality of water in the outwash aquifer system, (2) determine if a well field proposed for a site at the Elkhart Municipal Airport would draw leachate from the Himco Landfill, and (3) define the areal extent of the groundwater affected by the landfill and an east-side industrial park area.

The outwash aquifers are mainly composed of sand and gravel and are separated by a silt and clay bed. The saturated thickness of these deposits averages 375 feet and ranges from 85 to 500 feet. Where present, the silt and clay bed confines the underlying aquifer. The confining bed is absent in the area underlying the landfill and part of the airport. Average hydraulic conductivities of the sand, and the sand and gravel, are 80 and 400 feet per day respectively. Regional groundwater flow is to the south, southeast, toward the St. Joseph River.

The city of Elkhart obtains its water from both the upper and lower aquifers in the area. These aquifers are hydraulically connected with both aquifers showing elevated levels of organic chemicals down-gradient from the site.

DEMOGRAPHICS:

The closest residences are located directly next to the site on the southern perimeter. Down-gradient, south from the landfill, is a mobile home park which has approximately 150 to 200 mobile homes currently in place. In addition, there are several small industries located directly across the street, also down-gradient from the landfill. To the east and the west of the landfill are residential areas, comprising several hundred homes. The area to the north of the site is predominately agricultural.

ENVIRONMENTAL CONTAMINATION AND PHYSICAL HAZARDS:

Off-site and on-site environmental data are incomplete. There are six residences located next to the site. Contamination of the residences' shallow wells, ranging from 22-62 feet deep, was allegedly reported to the Elkhart County Health Department, Indiana State Board of Health (ISBH), and the EPA. Drinking water samples were taken in April of 1974 by the ISBH, which determined there was "no gross contamination", only an elevation in the level of manganese. The residents continued to report problems with the drinking water. In 1974, Mr. Himes drilled new water wells for these six individuals on the advice of the State Health Commissioner. These new wells were drilled to a depth of at least 150 feet. They were sampled in May 1984 and again in May 1985. The water quality at that time was found to be satisfactory.

Although many reports reference the fact that these six residential wells next to the site were contaminated, and were subsequently redrilled, no environmental sampling data for these wells seem to exist.

The USGS and EPA have performed some on-site and off-site groundwater sampling. The results of these samples are presented in Tables 1 and 2. No other sampling data either on-site or off-site, for this or anyother media exists.

Table 1
Groundwater Sampling
September 1979

Chemical	Maximum Level of Contamination (Well M)		(Well E)		(Well O)	
chloride, diss.	98	ppm	98	ppm	17	ppm
sulfate, diss.	620	ppm	190	ppm	27	ppm
bromide, diss.	7.1	ppm	5.9	ppm	0.1	ppm
sodium, diss.	570	ppm	400	ppm	8	ppm
potassium, diss.	51	ppm	53	ppm	1.1	ppm
magnesium, diss.	90	ppm	75	ppm	16	ppm
calcium, diss.	1200	ppm	64	ppm	57	ppm
iron, diss.	0.64	ppm	0.93	ppm	0.03	ppm
manganese, diss.	4.4	ppm	0.24	ppm	0.01	ppm
ammonia, diss.	450	ppm	20	ppm	0.02	ppm
nitrate, diss.	.09	ppm	3.8	ppm	2.3	ppm
trichloroethylene	55	ppb	<2	ppb	ND	
toluene	23	ppb	<2	ppb	ND	

ppb = parts per billion
ppm = parts per million
ND = non-detectable levels of contamination
diss. = dissolved

Well M is a shallow well on-site.

Well E is a shallow well off-site approximately 300 feet down-gradient from the site.

Well O is a composite of other shallow wells from the same aquifer in the county.

Table 2
Groundwater Sampling
September 1984

Chemical	Maximum Level of Contamination* (Well E)	(Well D)
aluminum	350,000	12,500
arsenic	200	26
barium	803	121
beryllium	11	<5
cadmium	10	<1
chromium	461	370
cobalt	132	<50
copper	555	73
iron	146,000	67,400
lead	401	73
manganese	2150	1630
mercury	1.4	0.21
nickel	422	103
selenium	14	<2
vanadium	326	<200
zinc	1630	164

* samples in mg/l or parts per million

Well E is a shallow off-site well approximately 300 feet down-gradient from the site (south).

Well D is a shallow off-site well approximately 100 feet up-gradient from the site (north).

POTENTIAL ENVIRONMENTAL AND EXPOSURE PATHWAYS:

The environmental pathways of concern are: the migration of these chemicals off-site via contaminated groundwater; direct contact with contaminated soils; inhalation of contaminated dust; surface water run-off into nearby creeks, ponds, and a water-filled former gravel pit; direct ingestion of contaminated soils; and a fire and explosion potential from methane gas generated from decomposing wastes.

Most residents in this area utilize shallow private residential wells for their potable water supplies. The Elkhart city municipal water company obtains their water from groundwater wells within a three-mile radius of this site, from this very same aquifer.

There is a great potential for children living in the residential areas to cross the street to play on this site. Children playing on this site could be exposed via direct ingestion of contaminated soils, inhalation of contaminated dust particles, as well as direct dermal contact with contaminated soils. In addition, there are two ponds located on-site of unknown depths which pose physical hazards. There is also a gravel pit adjacent to the site, which is filled with water. However, this pit is securely fenced.

During the site visit, strong odors characteristic of a landfill were noted. General refuse is known to be buried at this site and it is possibile that methane gas may be generated in sufficient quantities to reach explosive limits. However, no sampling data are available to address this concern. Many areas of distressed vegetation were observed. Small animals and/or evidence of small animals, rabbits and squirrels, were seen throughout the site. The possibility of hunting small game which might be contaminated exists.

Residents in the area have complained of rashes, diarrhea, blood poisoning, exhaustion, miscarriages, birth defects, and bizarre behavior.

CONCLUSIONS AND RECOMMENDATIONS:

Based on the available information, this site is considered to be of potential health concern because of the risk to human health caused by the possibility of exposure to hazardous substances via: ingestion of contaminated groundwater, direct contact with contaminated soils, inhalation of contaminated fugitive dust particles, ingestion of contaminated soils, ingestion of contaminated food stuffs, accidental drowning or injury, direct contact with contaminated water from surface water run-off into area creeks and streams, and the possibility of fire and explosion.

Additional data needs include the definition and location of the groundwater plume, additional sampling of down-gradient wells, ambient air monitoring, definition and quantification of contaminants present on-site, definition and location of off-site migration of contaminants from surface water run-off.

In addition, it is advisable that this site be secured to completely restrict public access.

When additional data and information become available, such material will form the basis for further assessment by ATSDR at a later date.